

# **Chapter-7**

## **Natural Hazards and Disasters**

**1. Choose the right answer from the four alternatives given below.**

**Question 1(i).**

**Which one of the following states of India experiences floods frequently?**

- (a) Bihar**
- (b) West Bengal**
- (c) Assam**
- (d) Uttar Pradesh.**

**Answer:**

- (c) Assam**

**Question 1(ii).**

**In which one of the following districts of Uttaranchal did Malpa Landslide disaster take place?**

- (a) Bageshwar**
- (b) Champawat**
- (c) Almora**
- (d) Pithoragarh.**

**Answer:**

- (d) Pithoragarh.**

**Question 1(iii).**

**Which one of the following states receives floods in the winter months?**

- (a) Assam**
- (b) West Bengal**
- (c) Kerala**
- (d) Tamil Nadu.**

**Answer:**

(d) Tamil Nadu.

**Question 1(iv).**

**In which of the following rivers is the Majuli River Island situated?**

- (a) Ganga
- (b) Brahmaputra
- (c) Godavari
- (d) Indus.

**Answer:**

(b) Brahmaputra

**Question 1(v).**

**Under which type of natural hazards do blizzards come?**

- (a) Atmospheric
- (b) Aquatic
- (c) Terrestrial
- (d) Biological.

**Answer:**

(a) Atmospheric

**2. Answer the following questions in less than 30 words.**

**Question 2(i).**

**When can a hazard become a disaster?**

**Answer:**

A hazard becomes a disaster when either there are no mitigating circumstances to prevent the disaster from happening or the mitigating circumstances fail. For example, if there are floods which lead to great loss of life and property, it will be called disaster. But if through GPS, it was pre-informed and evacuation was successful, it will be a hazard but not a disaster.

**Question 2(ii).**

**Why are there more earthquakes in the Himalayas and in the north-eastern region of India?**

**Answer:**

Indian plate is moving at a speed of one centimetre per year towards the north and northeastern direction and this movement of plates is being constantly obstructed by the Eurasian plate from the north. As a result of this, both the plates are said to be locked with each other resulting in accumulation of energy at different points of time. Excessive accumulation of energy results in building up of stress, which ultimately leads to the breaking up of the lock and the sudden release of energy causes earthquakes along the Himalayan arch.

**Question 2(iii).**

**What are the basic requirements for the formation of a cyclone?**

**Answer:**

Following are the basic requirements for the formation of cyclones:

- Large and continuous supply of warm and moist air that can release enormous latent heat.
- Strong Coriolis force that can prevent filling of low pressure at the centre because absence of Coriolis force near the equator prohibits the formation of tropical cyclone between 0°-5° latitude.
- Unstable condition through the troposphere that creates local disturbances around which a cyclone develops.
- Absence of strong vertical wind wedge, which disturbs the vertical transport of latent heat.

**Question 2(iv).**

**How are the floods in Eastern India different from the ones in Western India?**

**Answer:**

Important rivers of Eastern India are Brahmaputra, Ganga, Damodar, Mahanadi, Krishna, Kaveri, Godavari. In western India, important rivers are Luni, Mahi, Narmada and Tapi. In eastern India floods occur more frequently as compared to Western India because more rainfall takes place in eastern India as compared to western India. Moreover, floods of eastern India are more severe in comparison of western India floods.

**Question 2(v).**

**Why are there more droughts in Central and Western India?**

**Answer:**

In central and western India less rainfall takes place. Due to this, water scarcity takes place. Less rainfall, excessive evaporation, scarcity in ground water and water bodies create conditions of drought. Western India consists of deserts and central India has plateaus and in both regions ground water level is less. It creates drought conditions.

**3. Answer the following questions in not more than 125 words.**

**Question 3(i).**

**Identify the Landslide-prone regions of India and suggest some measures to mitigate the disasters caused by these.**

**Answer:**

Highly unstable, relatively young mountainous areas in the Himalayas and Andaman and Nicobar, high rainfall regions with steep slopes in the Western Ghats and Nilgiris, the north-eastern regions, along with areas that experience frequent ground-shaking due to earthquakes, etc. and areas of intense human activities, particularly those related to construction of roads, dams, etc. are highly prone to landslides.

Areas that have almost similar conditions to those included in the very high vulnerability zone are also included in this category. The only difference between these two is the combination, intensity and frequency of the controlling factors. All the Himalayan states and the states from the north-eastern regions except the plains of Assam are included in the high vulnerability zones.

Subsidence are most common in states like Jharkhand. Orissa, Chhattisgarh, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Goa and Kerala.

**Measures for Mitigation**

1. Promoting large-scale afforestation programmes.
2. Construction of bunds to reduce the flow of water.
3. Terrace farming should be encouraged in the north-eastern hill states.
4. Restriction on the construction and other developmental activities such as roads and dams, limiting agriculture to valleys and areas with moderate slopes, and control on the development of large settlements in the high vulnerability zones, should be enforced.

**Question 3(ii).**

**What is vulnerability? Divide India into natural disaster vulnerability zones based on droughts and suggest some mitigation measures.**

**Answer:**

Vulnerability refers to the risk of becoming a victim to a disaster. Those areas which are more prone to natural calamities are more vulnerable.

On the basis of severity of droughts, India can be divided into the following regions:

1. Extreme Drought Affected Areas: Most parts of Rajasthan, particularly areas to the west of the Aravali hills, i.e. Marusthali and Kachchh regions of Gujarat fall in this category. Included here are also the districts like Jaisalmer and Barmer from the Indian desert that receive less than 90 mm average annual rainfall.
2. Severe Drought Prone Area: Parts of eastern Rajasthan, most parts of Madhya Pradesh, eastern parts of Maharashtra, interior parts of Andhra Pradesh and Karnataka Plateau, northern parts of interior Tamil Nadu and southern parts of Jharkhand and interior Odisha are included in this category.
3. Moderate Drought Affected Area: Northern parts of Rajasthan, Haryana, southern districts of Uttar Pradesh, the remaining parts of Gujarat, Maharashtra except Konkan, Jharkhand and Coimbatore plateau of Tamil Nadu and interior Karnataka are included in this category. The remaining parts of India can be considered either free or less prone to the drought.

#### Remedial Measures

1. Provision for the distribution of safe drinking water, medicines for the victims and availability of fodder and water for the cattle and shifting of the people and their livestock to safer places, etc.
2. Identification of ground water potential in the form of aquifers, transfer of river water from the surplus to the deficit areas, and particularly planning for inter-linking of rivers and construction of reservoirs and dams, etc.
3. Remote sensing and satellite imageries can be useful in identifying the possible river-basins that can be inter-linked and in identifying the ground water potential.
4. Rainwater harvesting can also be an effective method in minimising the effects of drought.

#### Question 3(iii).

##### **When can developmental activities become the cause of disasters?**

##### **Answer:**

Development has created many such problems whereby disasters occur. There are some activities carried by human beings that are directly responsible for disasters.

1. Industrial development: Bhopal Gas tragedy, Chernobyl nuclear disaster, wars, release of CFCs (Chlorofluorocarbons) etc are examples where industrial development has created disasters.

2. Pollution: Increase of green house gases, environmental pollutions like noise, air, water and soil are some of the disasters which are caused directly by human actions.
3. Deforestation: There are some other activities of human beings that accelerate or intensify disasters indirectly. Landslides and floods due to deforestation, unscientific land use and construction activities in fragile areas are some of the disasters that are the results of indirect human actions.